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NEW YORK HOSPITAL.

REPORT

OF THE

BUILDING COMMITTEE,

TOGETHER WITH

AN ADDRESS

DELIVERED ON THE OCCASION OF THE INAUGURATION OF THE NEW BUILDING,

ON THE 16TH MARCH, 1877,

BY

WILLIAM H. VAN BUREN, A. M., M. D.,

ONE OF THE CONSULTING SURGEONS OF THE NEW YORK HOSPITAL, OF THE BELLEVUE HOSPITAL, &C.,
PROFESSOR OF SURGERY IN THE BELLEVUE HOSPITAL MEDICAL COLLEGE.

WITH

A DETAILED DESCRIPTION OF THE BUILDING.

New York:
L. W. LAWRENCE, STATIONER, 49 JOHN STREET.

1877.

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TO THE BOARD OF GOVERNORS

OF THE

NEW YORK HOSPITAL.

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The Committee appointed on the 5th of May, 1874, to report a design for a New Hospital Building for the accommodation of patients, as also the estimated cost of such building, respectfully report:

That, immediately upon their appointment, they addressed themselves to the task assigned them—holding their first meeting on the 7th of June, 1874, when designs were invited from seven architects. On the 26th of August, the Committee accepted the design of Mr. George B. Post, and referred the same to Board of Governors, by whom their action was approved. Detailed plans were prepared by the architect, and approved by the Board on the 25th of July, 1875—when the Committee were authorized to proceed with the work of construction.

The determination of the Committee being, so far as possible, to carry out the expressed wish of the Governors—that the new building should be perfectly fire-proof, should present the greatest obstacles to the absorption of poisonous matter from an accumulation of diseased patients, and, in short, embody all known improvements in construction and arrangement—a careful study of methods and materials was made, both theoretically and experimentally, and on the 29th of April, 1875, the first contracts were awarded, and the work was commenced forthwith.

During the summer of 1876, the Committee were authorized by the Board to make further improvements, by the construction of two additional stories to the administration building, on Sixteenth street; which have been carried out in accordance with the plans proposed.

About the same time, the Committee—with the addition of the late lamented Vice-President, James W. Beekman, as chairman—were appointed, as a Committee of Organization, to consider the subject of the administration of the new establishment, and to prepare plans for that purpose. The duties of this Committee were so intimately associated with those of the Building Committee, that they have been regarded as practically identical. On the 26th of February, 1877, a code of Provisional Rules and Regulations for the government of the house were reported, and adopted by the Governors.

The whole establishment being, after some unavoidable delay, completed and ready for occupancy, the formal opening took place on the 16th of March, of the present year, with appropriate ceremonies, and an Address, delivered at Chickering Hall, by Dr. Wm. H. Van Buren.

For a particular account of the building and improvements, the Committee beg leave to refer to the detailed description by Mr. Post, the architect, which is herewith presented, as forming a part of this report.

The expenditures, under the direction of the Committee, have been as follows:

For the Building Proper.

Mason Work	$126,519 60
Cut Stone Work	50,829 93
Iron Work	75,167 22
Plumbing Work	27,480 56
Tiling Work	24,773 70
Carpenter Work	65,538 47
Elevators	14,453 13
Plastering	19,169 36
Steam Heating	14,059 55
Architect	14,994 20
Boilers	6,003 00
Ventilation Pipes	5,959 05
Marble Work	7,700 47
Blowers	3,657 24
Fire-Proof Work and Materials	23,844 78
Excavating	1,997 00
Architects (four), $250 each	1,000 00
Gas Pipes	1,147 92
Expenses of Cleaning	2,721 07
Bronze Work	1,936 40
Hardware—Hinges, Locks, &c	5,549 40
Special Iron Work	267 77
Registers	1,319 73
Services Mr. Skeel, Engineer	876 54
Services Mr. Copeland, Engineer	150 00
Tiled Panels, Outside Building	730 00
Tiling Floor, Dead House	174 42
Steam Pumps	1,023 75
Cabinet Work, Apothecary Shop	600 00
Plates for Doors	435 14
Lithographing Plans	534 00
Felting Pipes	412 06
Bridge on Fifteenth Street,	281 69
Printing Specifications	218 25
Removing Rubbish	251 25
Surveying	85 00
Building Fence, Fifteenth Street	86 00
Gas Pressure Gauge	80 00
Work on Ventilation Pipes	63 74
Repairs to Dumb Waiters	17 40
Experiment with Test Pipes	75 00
Loan of Temporary Boilers	515 57
Electric Work	2,013 86
Connecting Well with Engine Room	34 25
Consultation on Ventilation	25 00
Alterations to the Administration Building, Building Vaults, Paving, and other improvements	52,125 48
Furnishing	38,171 46
Total	$595,069 41

The Committee are happy to be able to add, that all the work under their charge has been completed without serious accident.

All of which is respectfully submitted,

WILLIAM H. MACY,
JACKSON S. SCHULTZ,
WILLIAM B. HOFFMAN,
SHEPPARD GANDY,
D. COLDEN MURRAY.

NEW YORK, November 5, 1877.

AN ADDRESS

DELIVERED ON THE OCCASION OF THE INAUGURATION OF THE NEW BUILDING OF THE

NEW YORK HOSPITAL,

On the 16th of March, 1877,

BY

W. H. VAN BUREN, A. M., M. D.,

ONE OF THE CONSULTING SURGEONS OF THE NEW YORK HOSPITAL, OF THE BELLEVUE HOSPITAL, &C., PROFESSOR OF SURGERY IN THE BELLEVUE HOSPITAL MEDICAL COLLEGE.

We have assembled this evening, my friends, to do honor to an occasion which has already occurred several times in the history of our city—the opening of a new building, erected for the use of the sick by the "Society of the New York Hospital."

The advance of knowledge and civilization has not abolished the necessity for institutions of this kind. That necessity is still present with us, as in the earliest periods of our race of which we have historic record: the Buddhist rock temples of India bear on their walls laws for the government of establishments for the sick, engraved centuries before the Christian era; and in every successive phase of social existence the helpless and unfortunate have not failed to put forth a claim for succor from their fellow creatures.

Nor as yet has the progress of knowledge rendered excellence more easy of attainment in hospital construction. In this, as in all human effort, the recognition of a want outruns the capacity to grasp the means by which it is to be satisfied. As our perception of the requirements of the sick has grown to be more full and accurate, the problem of how to meet them, although with increased resources, has become more complex. Its solution, therefore, demands more diligence and skill, with a higher range of ability; and greater difficulty attends successful achievement. Comparison with similar enterprises in Europe shows that we Americans are more receptive of new ideas, more ambitious to advance, and less hampered by tradition. Our hospital patients represent a smaller dependent class, and are, as a rule, less helpless, but at the same time more exacting.

The first hospital on Manhattan Island was built by the Dutch early in the seventeenth century. It had the capacity, history tells us, "of five houses," stood near the fort at the southern extremity of the island, and was only finally demolished under subsequent English rule.

Most probably this Dutch hospital, in New Amsterdam, was suggested by the old *Binnengasthuis* in the parent city, which had been built not many years before. This venerable edifice bears on its outer wall a tablet of sculptured marble representing a wounded soldier borne by two comrades, which tells that it was originally founded for the use of the troops sent by Queen Elizabeth, under the Earl of Leicester, in 1587, to aid the Dutch in defending their liberties against Philip of Spain. It would seem, therefore, that the traits of love of country and good will to their fellow creatures belonged to the first settlers of this island, and come to us with our earliest inheritance.*

* There are some interesting points of construction in this old Amsterdam Hospital. It stands in the centre of the city, over a canal which receives its drainage; and in this present year (1876) an additional new stone building, of several stories, is being erected on the same site. The original old wards have a gallery around their walls, at a height of fifteen feet from the floor; and on this gallery are numerous windows, which are thus readily reached for the regulation of ventilation; the whole height of the ceiling of the ward being no less than forty-five feet. Below this gallery are no windows—only the doors leading to and from the wards. The veteran Tilanus, the leading surgeon of Holland, is still in daily attendance at this hospital.

More than a century had elapsed after Peter Stuyvesant's reluctant surrender to the heavier artillery of the English, before the original of the present New York Hospital was built on Manhattan Island; and not only had the rights of the earlier Dutch settlers passed into English hands, but English rule had been replaced by that of the American Republic, before the hospital was in actual operation. A royal charter had been granted to the original members of the present society as early as 1771; but the building erected under their auspices underwent strange vicissitudes. On the eve of its completion it was consumed by fire; and, when re-built, it was occupied—not by the sick, but by troops in the service of the "Continental Congress." As the hospital building was seated on an eminence, "with fresh water upon all sides," they surrounded it by a ditch, for purposes of defence. These earliest occupants of the old New York Hospital were replaced, in the changing fortunes of war, by Hessian troops, in the pay of Great Britain; and by them it was used as a barrack until the final evacuation of the city by the British in 1783. The year after this auspicious event saw the hospital building surmounted by still another flag, and occupied by the legislature of the newly created State of New York. Subsequently it was used, in part, for medical teachings; and on one occasion was attacked by a mob, excited by imaginary stories of unlawful dissections, and lives were lost in its defence under Mayor Duane and Baron Steuben.

You all remember the quiet old building of grey stone, with its green lawn and graceful old elms, which, like the church-yards of Trinity and St. Paul's, formed an oasis in the commercial desert of our great thoroughfare; and how sadly we felt when stern necessity compelled its removal, not ten years since. I can recall the voice of the venerable Najah Taylor a quarter of a century ago, as he told how, when he was a young clerk—about the year 1808—he rode out from his place of business in the lower part of the city to the hospital to enquire after a patient; and I can see him pointing out a spot in the front wall of the old building where there was a hook to which he hitched his horse, and telling how there were no other houses near the hospital then, but a clear slope from its rear down to the North River. Before this excellent man—then Vice President of the Board of Governors—was gathered to his fathers, so rapid was the growth of the city, that the proposition to retreat before the advancing tide of business had been already mooted.

During the three-quarters of a century that intervened between its first occupation as a hospital and its final demolition in 1869, this edifice had served its beneficent purpose as the principal, and for a long time as the only, public house for the sick in the rapidly-growing commercial capital of the new republic,—a monument to the humanity and public spirit of its earliest promoters, the physicians Peter Middleton, John

Jones and Samuel Bard—to whose petition the charter had been granted by George III, and whose names are specified in the original document, which is still preserved. During this time the population of the City of New York had undergone an increase—unprecedented in the history of cities—of from 30,000 to 750,000; and the governors of the hospital nominated in its original charter, and their successors, had wisely managed the institution, and faithfully administered its resources. These were derived both from subsidies by the State and from private contribution.

New buildings had been added, as they became necessary, and the original edifice enlarged. In 1808 the first building ever devoted to the care of the insane in this State was erected on the hospital grounds, and opened with sixty-seven inmates. As the necessity for larger provision for this class of patients became manifest, a new asylum was erected at Bloomingdale, in the suburbs, in 1821. The old "insane" wards were then remodeled as a hospital for seamen, and under the name of the "Marine Building" were, in 1825, devoted entirely to their use. It did good service for a quarter of a century, but necessity for more room determined the governors finally to replace it by a more commodious edifice. Accordingly, in 1855, the new "South House" rose upon its site—a structure which, in the language of the late Joseph Mather Smith, "embodied every modern improvement in the architecture of hospital and other humane institutions."* In its provisions for ventilation, heating and airspace, this building was regarded, at the time, as a model of hospital construction.

Admissions to the hospital for surgical accidents had become at this time more numerous, in proportion to purely medical cases, in consequence of the increase in business activity and the rapid growth of the city, and cases requiring operations were attracted from a distance by the reputation for skill of the surgeons of the institution. It was for the better accommodation of these surgical patients that the old "Main Building," already provided with wings, had been again remodeled and improved in 1850. This enterprise had been undertaken by the governors only after careful study of all existing methods and improvements in hospital construction. The still more perfectly fashioned "South House" had been the outcome of all this experience.

It is worthy of remark here, as showing the intrinsic difficulties which attend the problems involved in hospital construction, that the average success of surgical operations in the new "South House," with all its improvements in ventilating and heating, never equaled that in the renovated old "Main Building."

* An address delivered on the occasion of the inauguration of the new South Building of the New York Hospital, on the 18th of April, 1855, by Joseph M. Smith, M. D., Senior Physician of the New York Hospital, Professor of the Theory and Practice of Physic and Clinical Medicine in the New York College of Physicians and Surgeons, &c., &c. New York, 1855.

In this rapid and imperfect sketch of the rise and progress of the New York Hospital, we now approach a new epoch in its history, and may properly pause and ask the question: how far, up to this period, the objects for which the institution had been chartered were attained?

The remarkable political events which were occurring at the time the enterprise was first undertaken, marked the close of a period during which our infant nation had been gradually acquiring the strength to assert its existence, and the beginning of that struggle at the end of which its independence was acknowledged. After this the new nation entered upon a career of rapid development—of which the expansion of the City of New York furnishes, perhaps, the most typical illustration. For three quarters of a century the Society of the New York Hospital had been uninterruptedly engaged in supplying the wants of the vigorously expanding metropolis, which during this period had attained the position of the second commercial centre of the world, with an exceptionally active population of nearly a million. In carrying out this responsible duty—alone, for during the greater part of this time there was no other properly equipped hospital within the city limits—there is no record of any failure in its entire fulfillment, nor any evidence of dissatisfaction as to the mode of its performance. On the contrary, we find recorded, by the able and exact historian of the hospital—the late Hon. Gulian C. Verplanck—the fact of gifts, from year to year, of sums of money from citizens, and also from the State, and of bequests and legacies—all for the use of the governors of the hospital,—evidences of the respect and confidence their public services had commanded. Their beneficent influence extended beyond the limits of the city; for the Federal Government had availed itself of their services for the care of sick sailors, for whom it alone is responsible, and for whose care, elsewhere, large and expensive hospitals are provided. Their intelligent humanity had included, also, a class of patients not ordinarily received in general hospitals—lunatics; and under their fostering care an institution had grown into existence of which the city, great as it has become, is still justly proud—the Bloomingdale Asylum for the Insane. And I will take occasion to remark here that, with so much of the passions and blindness of human nature as institutions of this kind have always to contend against, it is obviously the duty of the intelligent and educated members of the community to use their influence to counteract the unreasoning prejudices which are too often and too easily aroused by thoughtless misrepresentation against them. Instances of violence and destruction of life are constantly being recorded by the public press as committed by insane persons, whose friends have been thus induced to prevent their restraint in these excellent asylums—the existence of which in our midst are the most undoubted tokens of advancing civilization.

But the evidence that the "Society of the New York Hospital" had thus far fulfilled its purpose is not yet complete. Zealous for the improvement of the profession from which the hospital received its first impulse of life, and by the members of which so large a share of its practical daily work is done, its governors had always sought to advance the cause of medical education. They recognized that the interests of the sick in their charge were promoted by securing the highest professional skill for them, and by publicity in its exercise. The physicians and surgeons of the hospital had, therefore, been encouraged to employ their great opportunities for observation and experience of disease in teaching others at the bed-side and in the operating theatre—where ample accommodations had been provided for spectators and students. They had been protected in their efforts to seek out the causes of fatal disease by pathological enquiry in the dead-house; and, as a result, a cabinet of morbid anatomy had been accumulated, of great value for illustrating the nature of diseases and the means required for their cure. A well selected medical library, commenced in the last century, had increased annually under the auspices of the Board, and had grown to be much frequented and highly prized by the profession.

As a consequence of this liberal policy, the New York Hospital, whilst accomplishing its purpose of affording relief to the sick poor of the city, had become a great centre of instruction in the art and science of medicine. It had become known abroad as the seat of original operations and solid advances in medicine and surgery. Many of its physicians had achieved reputation as teachers; and young men, who had completed their education within its walls, carried its methods and teachings away with them to all parts of the country as the basis of future success in practice. Endorsing the statements of one of the surgeons of the hospital, who in a public lecture, in 1847,* formally set forth its resources for teaching, Verplanck, who served the institution thirty-five years as governor, says in his history, in 1856, "the New York Hospital has now become the most extensive school of practice in the country."†

May we not conclude that the fullest hopes and anticipations of the originators of the enterprise would have been more than realized if they could have witnessed all these results of their efforts? And, admitting that this conclusion is just, would it not be a proper tribute to the memory of the excellent corporators and governors, who during this period had given so much of their time and thought and active effort to the service of their fellow-citizens, to inscribe their names upon tablets, and make them a part of the walls of the new hospital?

* "*Lecture on Practical Education in Medicine*," &c., by Dr. John Watson, in New York Journal of Medicine, 1847.

† An account of the New York Hospital, &c., printed by the Governors, with Charter, Laws and Regulations of the institution. New York, 1856. Page 95.

Amongst the professional men of the hospital noted for original achievement, I will take leave to mention Prof. Samuel Bard, of King's College; spoken of by his colleague, Middleton, in an address which has come down to us, as the principal founder of the hospital. In 1770 he published, under the name of "throat distemper," an account of endemic diptheria, which is a faithful picture of this disease as it still prevails with us. His account was translated into French, and published in Paris, ten years before the appearance of the essay of Bretonneau, who first gave the disease its present name. Bard was, also, the author of the first work on obstetrics published in this country. His portrait, with others of men of note who have served the hospital, adorns the walls of the rooms in which the governors hold their monthly meetings.

About the same time, Dr. John Jones, Professor of Surgery in King's College, and subsequently a surgeon of the hospital, published an essay on "the treatment of fractures," which proved of great service during the war of the revolution.

Dr. Richard Bayley, a pupil of the celebrated William Hunter, has the credit of the first successful amputation at the shoulder-joint in this country, in 1782.* Bayley delivered lectures on surgery, in the then unoccupied building of the hospital, in 1787; and his son-in-law, Dr. Wright Post, lectured there, at the same time, on anatomy. In the following year the so-called "doctors' mob" occurred; in which the building was sacked, and Bayley's valuable cabinet of anatomical and pathological preparations—many of which he had brought from London—were conveyed away, in carts, by the rioters and buried.

The first successful ligature, in this country, of the primitive carotid artery, for aneurism, was done by Dr. Wright Post, at the New York Hospital, on the 9th of January, 1813.† This excellent surgeon, also, successfully tied the external iliac artery, at the hospital, for aneurism, during the following year;‡ and finally, in 1817, accomplished his most brilliant success—in which he saved a human life, by ligature of the subclavian artery, for the first time in the annals of surgery.§

After this, in May, 1818, followed the great achievement of Valentine Mott, who succeeded in placing a ligature still nearer the heart—upon the innominate artery; also in the operating theatre of the New York Hospital. Mott subsequently tied both carotids in the same patient, at the hospital, at an interval of fifteen minutes—which was an unprecedented undertaking; and, in 1824, accomplished the first successful amputation in this country at the hip-joint, upon a patient in the

* John Watson, M. D., on the Progress of Medicine in America.—[N. Y. Med. and Surg. Journal, 1839. Vol. I, page 20.

† American Medical and Philosophical Register, New York, 1814. Vol. IV, page 366.

‡ Idem, page 443.

§ Med. Chir. Transactions, London, 1818. Vol. IX, page 185.

hospital. This surgeon, also, first saved a human life by applying a ligature to the primitive iliac artery for aneurism.

Dr. Alexander H. Stevens, in 1823, arrested a rapidly-growing disease by removal of a large portion of the upper jaw, and restored the patient to health.* He subsequently repeated this operation no less than eight times, with great success. Dr. Stevens introduced many improvements from abroad, and was esteemed second to none for his great sagacity and professional judgment.

Dr. Francis U. Johnston, as early as 1832–33, relinquished the old plan of treating fevers by depletion; substituting the moderate and systematic use of food and stimulus.†

Dr. John Kearny Rodgers introduced the use of silver wire to keep the ends of the denuded fragments in contact in the operation for ununited fracture.‡ This eminent surgeon was the first to succeed in applying a ligature to the left subclavian artery, near its origin; which operation he accomplished, at the hospital, in 1846.

The names of the physicians and surgeons of the hospital, which our limits will only permit to be mentioned, cannot fail to revive recollections of departed worth: Richard S. Kissam, Samuel Borrowe, Valentine Seaman, Samuel Latham Mitchell, David Hosack, Edward Miller, William Hammersley, John Watts, Thomas Cock, John Nelson, John B. Beck, Joseph Mather Smith, John Appleton Swett, John C. Cheesman, Henry D. Bulkley, John Watson, Edward Delafield, Thaddeus Halsted, and others who were prominent in their day, and who served the institution faithfully.

But, for long and faithful service, the Society has to regret the recent loss of one whose claims are in many respects without precedent. For forty years, Dr. Gurdon Buck, who was but yesterday amongst us, had been a surgeon of the New York Hospital, and during this period no one had done more to maintain its character for sound and skillful practice. His name will be specially identified with the reputation of the hospital for the successful treatment of fractures, which constitutes so large and important a proportion of its practical surgery. The great improvement in effecting extension in fractures of the femur, by means of adhesive plaster and the weight and pulley, was perfected by his patient labor in the wards of the New York Hospital, and introduced into general use by Buck. Besides this, he first saved life by an original operation in œdema of the glottis, tied the primitive and internal carotid simultaneously, successfully treated ankylosis of the knee by excision of a wedge-shaped portion, attained excellent results in deformities of the

* Sterling's Translation of Velpeau's Surgical Anatomy, N. Y., 1830. Appendix, page 517.

† Shook's Report of Cases of Fever Treated in medical wards of New York Hospital.—[N. Y. Jour. of Med. and Surg. Vol. I, 1839, page 83.

‡ Idem. Vol. I, 1839, page 350.

face by plastic operations, and first practiced lithotrity on a large scale in this city. There are few of our public charities which did not receive professional aid from Dr. Buck; but no one of them was so near his heart as the New York Hospital. As a model of devotion to scientific surgery, and fidelity in public service, let us cherish his memory in honorable association with the worthies of the past.

After the completion of the new "South House," in 1855, the Society of the New York Hospital was left with a debt of about $80,000. Their income was soon after reduced by the expiration of the period for which, twenty-nine years before, the State had granted an annual subsidy of $22,500. This grant was never renewed, although several small loans, without interest, were subsequently made to the governors, and, in 1866, one absolute grant of $12,000. The New York Hospital had never been a city hospital in the sense of drawing its support from money granted by the city.

In 1861 the debt had increased to $140,000; and, in 1865, the governors stated, in their annual report, that their expenditures each year exceeded their income by about $30,000. The increasing cost of all articles of food at this time aided in crippling their resources; and, although the governors had paid $72,000 out of their own pockets, it became necessary to gradually restrict the admissions of charity patients—so that the inmates of the hospital were in time reduced to sailors and pay patients only, with such accidents as could not without inhumanity be refused. The hospital property had also become a heavy burden, on account of assessments made upon it by the city government for city improvements. In short, there was no escape from the conclusion that the Society could no longer continue to manage its financial affairs, as formerly, without a radical change; and its steadily diminishing income, viewed in contrast with the enormously increased value of its real estate, suggested the nature of that change.

The minutes of the meetings of the Board of Governors, which are open to the inspection of all interested in the welfare of the hospital, show that the question of the sale or leasing of the Broadway property had been discussed at intervals ever since 1858, and they contain the records of many resolutions and of the appointment of many committees to consider measures looking towards the capitalization of the property.

An effort was made by certain members of the Board, who could not reconcile themselves to the project of abandoning the old hospital site, to raise enough money by private subscription to relieve the Society from its embarrassments; but the attempt was without success.

On the 20th of May, 1868, it was resolved that "it is expedient to dispose of the whole or part of the lots comprised in the Broadway prop-

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erty"; and, on the 6th of October following, it was finally determined that they should be leased for a term of years.

The governors did not propose at this time, apparently, to suspend the operations of the hospital entirely; for, after considering various plans, it was proposed to use the buildings at Bloomingdale as a hospital—removing the asylum to a site, already purchased, at White Plains. But this project was abandoned; for the recent erection of the Roosevelt Hospital, on the west side, and the increasing efficiency of Bellevue Hospital, on the east side, with St. Luke's and the Presbyterian Hospitals in the centre of the island, seemed, for the time, to furnish enough hospital accommodation for the existing wants of the city. Several years were, therefore, allowed to elapse, during which the income from the Broadway property, which was now yielding annually more than $150,000, was permitted to accumulate.

A careful survey of the facts proves that the cause of humanity did not suffer materially by the removal of the old Broadway hospital. In their Report for 1871, the governors show that they were still unable to resume charitable work; and that, in consequence of the adoption of the ambulance system by the city authorities, cases of accident, formerly received by them, were taken with facility to Bellevue and the other hospitals.

After considering various plans for establishing a hospital within the city limits, and influenced by a desire to provide as soon as possible a central and accessible administration building for the Society, and a suitable place of deposit for the library and pathological museum, the governors voted, in February, 1874, to purchase the Thorn mansion, in Sixteenth street, with the purpose of erecting, on the rear lots, a House of Relief.

To provide, in the interim, for any possible want of accommodation for cases of accident in the lower part of the city, it was resolved, in June, 1875, to establish a House of Relief on Chambers street, and on the 3d of July it was in operation.

The excellent library of the hospital was, meanwhile, arranged in the new and commodious quarters which had been thus provided for it, and improved facilities afforded to the public for its use for purposes of consultation and reference. The wants of its numerous visitors are met by the able and faithful librarian, Dr. John L. Vandervoort, who has been for thirty-five years the trusted custodian of the literary treasures of the hospital. Its library is one of the unique features of this institution, which will always command for it the respect and kindly feeling of the medical and scientific members of our community. On its shelves, with an ample provision of old authorities and standard works, are always to be found the latest and best journals and books of reference; and by

these the scientific corps of the establishment is kept in communion with the learned in all parts of the world. The library is a noble witness to the liberal spirit which has guided the counsels of the Society, and it is regarded as a sacred, inherited trust, to provide with steadily enlarging generosity for its support and increase.

Opportunities soon offered of adding more land to the Thorn purchase, and the conception of the present building—designed more especially for acute cases and accidents—was substituted for the original purpose of erecting a simple House of Relief on the rear lots. Plans for the construction of the new building were at once undertaken, and in February, 1875, they were finally adopted.

The nature of its site influenced the larger features in the design of the proposed edifice, for its building area was limited; hence the outlying wards for occupation by the sick were necessarily superposed, whilst the Thorn mansion was retained as a central administration building. Recognizing the possibility in the future of enlarging the area of open space about the hospital, it was sought to counterbalance any present disadvantages by striving for perfection of construction in details. In this design, the Building Committee has been most ably seconded by the professional skill of Mr. George B. Post, who, whilst making no sacrifice of utility or comfort to external appearance, has yet achieved an architectural result which cannot but command praise.

In solving the difficult problems of warming and ventilating, ingenious and novel methods have been employed. Provision is made for introducing fresh air, at any required temperature, into all parts of the building by means of a powerful fan-blower in the basement. Suction power has also been secured by placing a similar fan-blower in the lantern at the highest peak of the roof. Thus, by numerous openings for air escape near the ceilings, and also in the floors of the wards under each bed, a constant change of air is effected without perceptible draught. Chilling downward draughts from the windows are met by upward currents of warm air from perforated window-sills. The ventilating apparatus is designed to be effective not only during the cold of winter, but also in the close, still weather of the warmer seasons. The management of the plumbing, the arrangements for light, for water supply and bathing, for electric communication and by speaking-tubes in every direction, and for absolute protection against fire—the location of the kitchens and laundries and disinfecting rooms in the upper stories, and the ample provision for carriage by elevators—are all worthy of notice; and these, with other details fully described in the report of the architect, you are invited to inspect.

Absolute perfection in hospital construction, it is needless to say, has not as yet been attained—if, indeed, it be attainable. Its pursuit seems

to involve, inevitably, the sacrifice of some one vital consideration in favor of another of equal importance—and, therefore, a constant necessity for compromise.

In our recent war, the great desire to economize human lives led to a careful scrutiny of the best methods then in use, and the Federal Government asked and received suggestions from experts—some of which were adopted and tried on a large scale. For the purposes of a military general hospital—with safe and ample quarters for sudden and large accessions of sick and wounded, and provision against over-crowding—the plan of an indefinite number af outlying pavilion wards of one story for patients, with a central building for officers, was found to work well, both as to hygiene and administration. Its success attracted attention abroad, and buildings on the so-called American plan have been since erected at Leipzig, Berlin and Kiel. For military purposes, where large space is at command and resident surgeons are provided by government, this is probably the best style of hospital building; but in civil life, and especially for a hospital in a central position in a large city, more compactness in construction has generally been found an unavoidable necessity. I think it may be asserted that in civil life the mortality in pavilion hospitals has not proved materially less than the average elsewhere. It has been a common error to trust too much to construction, and to undervalue the importance of strict cleanliness, isolation, and other sources of safety.

The question has been asked, with apparent pertinence: Is it proper to erect a hospital in a central position in a large city? Does not a due regard for the rights of others, as well as the best interests of the sick, demand a suburban locality, with a more liberal air space and less dense surroundings? From one point of view the same arguments have been urged against hospitals in large cities which had proved valid against intra-mural interments. But the rights of the dead and of those disabled whilst living can hardly be compared. The constantly improving conditions of city life may permit us, in the near future, to dispense with urban hospitals; but the project, at present, seems not entirely equitable. Their traditional experience and familiarity with the wants of the class seeking hospital relief has forced the governors to these conclusions: that the time has not yet arrived when they would be justified in offering their aid to the stricken or maimed laborer, to the mechanic with a crushed limb, the burned woman, the scalded child, or the stranger overtaken by calamity in the city—only from a distant suburb; that the friends of a very sick or badly injured patient are naturally unwilling to have him removed to a distant point where they cannot readily reach him; that these unfortunates have their rights, which may not be ignored; and that the great advantage of prompt and efficient

succor near at hand, in a grave crisis, is to them of more importance than country air.

In the case of the new Royal Infirmary of Edinburgh, now in process of erection, a portion of a public park is allotted to the hospital buildings, and here the difficulty is in some degree compromised; but, in this instance, they are of several stories, and of stone. In the Amsterdam Hospital, already mentioned, a large, new stone building, of several stories, has just been erected over arched canals, in the centre of the city. The magnificent structures of the new St. Thomas Hospital on the banks of the Thames, in the centre of London, were placed there after carefully weighing the comparative advantages of a suburban site. A large, new wing, of several stories, has just been added to the London Hospital, in one of the most densely populated quarters of the metropolis. The new Hotel Dieu, of Paris, is being rebuilt near its former central site, after full discussion of the same question.

These facts are cited to show that the necessity for more or less compactly constructed hospitals, in central positions, is still recognized in other great cities.

It would seem that so long as men continue to aggregate themselves in cities—a tendency which advancing civilization seems to favor, so long will they require hospitals in their midst—at least for casualties of a certain class; and the criticisms urged against city hospitals will be found to apply with about equal force to cities themselves.

The advantages of a suburban site for a hospital are undisputed; they comprise the considerations which render life in the country more healthful in certain respects than city life. But we are compelled to recognize counterbalancing disadvantages; not the least amongst these is the presence of malaria, which still lingers in most of the available localities in the immediate vicinity of our city. As a suburban hospital is comparatively inaccessible to the unfortunate compelled to resort to it, and also to the professional expert whose services are retained for him, it follows that an institution thus located generally assumes the character of an asylum for chronic cases, with a resident physician in charge. The governors of the hospital have had occasion to entertain the idea of such an establishment for the future, and that it might accommodate convalescent patients from the new hospital—which is, in a certain sense, only a larger and more perfect House of Relief; but, for the present, the emergencies of the intensely active life of a city like ours have seemed to them to call for a well-equipped hospital near the centre of activity—certainly for a hospital with a limited number of beds, like this which is about to be opened, for acute and urgent cases which might possibly be exposed to danger by removal to a greater distance.

As we have already seen, the obligation of aiding the progress of medical knowledge has always been recognized by those who have guided the policy of this Society. It would seem to be self-evident that, on the score of both interest and duty, the resources for teaching at the command of every great hospital administration should be made available for the instruction of young physicians in the practice of their art, and for the training of nurses. Not only the hospitals under their charge, but the community at large are directly helped by the training of proper persons as nurses for the sick; whilst the whole nation is benefited by the educational facilities afforded to its physicians. New York is steadily growing to the position of the centre of medical education in our country. The hospital that bears its name, and the physicians and surgeons connected with it, have heretofore contributed in no small degree to this result. It has not been the least cogent argument in favor of rebuilding the hospital in a central position, that it would again be accessible to students of medicine as a clinical school. In the day, which is fast approaching, when a higher standard of medical teaching shall be reached, when the professor's chair shall be well endowed and filled by the most competent, when the character of a school shall be judged by the well tested scholarship of its graduates rather than by their numbers—then, as now, the hospital will constitute the most essential and indispensable part of the apparatus for successful teaching.

In the matter of hospital hygiene, as in hospital construction, science has not as yet spoken her last word. Since the Federal Government adopted the plan of pavilion hospitals at the suggestion of the Sanitary Commission, the application of a new discovery in physical science to the wants of practical surgery has rendered us, in a certain degree, independent of hospital construction. It has been shown how we can keep wounds sweet and healthy, and conduct them to a favorable ending by a shorter and surer route than that heretofore followed, and thus prevent hospital patients from poisoning each other. Pasteur's demonstration that putrefaction is a fermentative process, that certain organic particles floating in the air as dust constitute the ferment or yeast, and that the destruction or exclusion of these germs will infallibly prevent septic change in substances prone to take on putrefaction, promises to alter many of the present methods of practical surgery. By preventing putrefaction in recent wounds, we cut off the most fertile surgical source of hospitalism. In addition to the means furnished by judicious hospital construction to secure uncontaminated air by forced ventilation, we shall therefore be able, hereafter, we are told, to keep the air of a hospital pure (surgically) by eradicating the sources of impurity. This has, apparently, been demonstrated to be practically feasible by the use of agents capable of destroying the vital energy of putrefactive germs.

The antiseptic method of dressing wounds, based on Pasteur's experiments by Prof. Lister of Edinburgh, has already materially diminished the percentage of mortality in his surgical service. In his wards in the old Royal Infirmary, built in 1734, in apartments once used as a grammar school, where Walter Scott received his early education, in the midst of the city, and with the most primitive provision for ventilation, wounds of the knee-joint now get well, as a rule, under methodical antiseptic dressing, whilst pyæmia and erysipelas are almost unknown. I have received evidence to the same effect from Mr. Howse, of Guy's Hospital, London, who failed in but two cases of excision of large joints out of forty-eight. Mr. Thomas Smith, of St. Bartholomew's, has also reported unprecedented success in treating wounds of large joints by the antiseptic method.* I specify wounds of joints because they are a class of surgical injuries attended, under ordinary modes of dressing, by great danger to limb and life. Similar testimony as to the efficiency of treating wounds antiseptically, in preventing hospitalism, reaches us from Germany.†

The eminent surgeon who first practically applied Pasteur's discoveries to the wants of surgery, has lately visited our country and given us a personal demonstration of his method. In answer to a question as to how far the construction of a hospital would be likely to influence the results of antiseptic surgery—a question suggested by the four stories of superposed wards of the Charity Hospital at Blackwell's Island, which we were visiting—he replied, "It is immaterial how many stories of "wards there may be in a hospital, provided that the details of the "antiseptic method are accurately carried out in all of them. If these "details are faithfully observed, hospitalism can be prevented."‡

Here, surely, is a novel element in hospital hygiene—of more practical value, apparently, than hospital construction, whose faults even it seems able to neutralize; for we have seen unusually successful results

* London *Lancet*, July and August, 1876.

† Prof. Von Nussbaum, of the State Hospital at Munich, in whose wards hospital gangrene had been prevalent with steadily increasing virulence for three years, had tried every known method of arresting the disease, and at last adopted Lister's antiseptic plan of dressing in all its details. After this, hospital gangrene ceased, and not a single case, Prof. Von Nussbaum states, has since occurred in his wards, although at the time of its first use eighty per cent. of the surgical patients had been affected.—[British and Foreign Med. Rev., Jan., 1876; from Archiv. fur Klinisch Chir., Bd. xviii, heft 4.

Statements are also on record from Bardeleben and Von Langenbeck of Berlin, Thiersch of Leipzig, Volkmann of Halle, Esmarch of Kiel, and Saxtorph of Copenhagen, that whereas pyæmia and other septic diseases had been disastrously common in their large hospitals, they had, since the introduction of Lister's method of dressing wounds, almost entirely ceased.—[Lister's address before the Surgical Section of the British Medical Association of Edinburgh, August, 1875.

‡ As to the position and authority amongst men of science of the author of this opinion we have good evidence. The present head of the Royal Institution of Great Britain, the successor of Sir Humphrey Davy and Faraday, in a recent lecture on "Fermentation, and its bearing on the phenomena of disease," referring especially to its application to surgery, uses the following language: "Here we come directly face to face with the labors of a man who has established for himself an imperishable reputation in relation to this subject—who combines the penetration of the true theorist with the skill and conscientiousness of the true experimenter, and whose practice is one continued demonstration of the theory that the putrefaction of wounds is to be averted by the destruction of the germs of bacteria. Not only from his own reports of his cases, but from the reports of eminent men who have visited his hospital, and from the opinions expressed to me by continental surgeons, do I gather that one of the greatest steps ever made in the art of surgery was the introduction of the antiseptic system of treatment, practiced first in Glasgow, and now in Edinburgh, by Prof. Lister."—[Popular Science Monthly, New York, Dec., 1876; page 146.

obtained by its aid in badly constructed, old-fashioned, and long poisoned hospital buildings. The proposition is in no respect unpractical, or sensational; on the contrary, it is rational in theory and has worked well in practice when tested. It certainly presents claims, at least, to a fair trial. From my own observation of its practical workings abroad, I find myself unable to resist the conviction that the ideas embodied in Lister's method, with such modifications as time and increasing knowledge may impress upon it, promise to effect great and favorable changes in the results of practical surgery, and especially to improve the conditions and chances of recovery of the hospital patient. For this reason, I have felt justified in giving the subject a place in my remarks this evening. It seems to me to take rank with the great recent improvement in nursing by trained women, as one of the factors by which the standard of success of the modern hospital is to be determined.

In connection with the subject of nursing, I will take leave to remark that, in a recent visit to the English hospitals, I observed that the head nurse, or "sister," in charge of each ward, always accompanied the chief surgeon at his visit, and manifested, in her watchful desire to hear his remarks and suggestions, a personal interest in the welfare and progress of each individual under her care—which seemed to me a great improvement upon old usages. I got no evidence of clashing, in their respective jurisdiction, between the nurses and professional attendants—a difficulty avoided, apparently, by securing high personal qualities on both sides. The nurse seemed to hold the attitude of a female relative in charge of a patient in private life to the attending physician, with the great advantage of having been thoroughly trained to her proper work. This most natural and desirable adjustment of function, which is effecting so much good, is due in a great degree to the efforts and example of that noble Englishwoman, Florence Nightingale, and her self-sacrificing associates.

I owe to the courtesy of Sir James Paget, President of the Royal College of Surgeons, an expression of opinion as to the merits of Lister's mode of dressing wounds, which was, in general terms, favorable; "but," he added, "I am disposed to attribute the decrease in mortality after sur-"gical operations, in the London hospitals during the last ten years, "mainly to the improvement in the nursing of our patients." This statement, as far as it asserts the great advantages of nursing by trained women, I am confident expresses the judgment of a majority of English hospital surgeons.

With the advantages promised from all these sources, there is no apparent reason why a patient in a ward of our new hospital building should not be as safe from every avoidable risk or danger as in the most luxurious private home. Nay, more: as a stranger, away from home and overtaken by sickness or accident, I should esteem it a privilege to

be received and cared for in one of its private wards; and I should prefer such quarters to any private or public house in the city.

I trust that the statement may not be regarded as invidious, that I have seen nothing abroad that equaled, in the aggregate of its provisions for the comfort and welfare of the sick, the building that is now to be devoted to their use.

New York, August 31st, 1877.

THE BUILDING COMMITTEE OF THE
SOCIETY OF THE NEW YORK HOSPITAL:

GENTLEMEN:

In compliance with your request that I should prepare a description of the New Hospital on Fifteenth street, and of the alterations of the Administrative Building connected with it on Sixteenth street, I have the honor to submit the following statement and illustrative drawings:

Before proceeding to a detailed description of the building and of its arrangements, I will briefly describe the general principles of construction which have governed its design, and the selection of materials used in its construction. It may not be improper for me to state, in this connection, that when I was appointed architect for this work, I was thoroughly impressed with the conviction that the first consideration in the design of such a structure should be to secure the most perfect arrangements to administer to the needs of the patients, to give them every possible advantage of comfort, light and ventilation, and thus to secure to them the best chance for ultimate recovery; and that I should therefore be most culpable if I sacrificed any utilitarian considerations, even most remotely affecting this end, to æsthetical considerations of proportion or architectural effect.

Thus believing from my study of the subject, that to achieve the best result for the patients in the wards, each bed should be separated from that adjoining it on either side, by a window, and that beds should in no cases be coupled, I resisted the temptation to group the windows for exterior effect, and arranged the walls with regular successions of 3 ft. 7½ in. piers, and 3 ft. windows. The Wards, Out Patient Department, Autopsy Room and Theatre, in fact all rooms were made the size and shape which was considered to be best for their respective purposes: and to reduce the absorbing surfaces, and thus decrease the danger of the retention of infectious matter, the minimum quantity of wood has been used in the building, and all trimmings for doors and windows have been

omitted where they were not absolutely essential. Where it has been necessary to use wood, selected rock maple has been employed, as this has been proved to be the least absorbent of the available woods. To accomplish the same end, and to render the building strictly fire-proof, the floors have been uniformly laid with iron beams and brick arches covered with the hardest pottery tiles, and fire-proof hollow blocks and hollow burned bricks have been substituted for studs and laths, for partitions and furring. In order to secure the most perfect interior wall covering, samples were procured of all the cements, mastic marble cement and stucco compositions which are used for such purposes, and their relative absorbing powers were carefully tested by the Curator of the Hospital. It was found by him that a very hard-troweled lime and white sand mortar was superior to all other samples submitted. This material has consequently been used throughout the building for its wall and ceiling finish. The bases are of marble. As a result, the whole work is of such a character, that when desirable, the wards and rooms connected with them may be washed out with a hose. The plumbing is of the most perfect character. It is executed with seamless tinned brass pipes. Most of the pipes are exposed. Having mentioned the general principles of construction, I will proceed to a description of the building.

The New Hospital Building consists of a main building having a front on Fifteenth street of 175 ft., and a depth of 36 ft.; a rear central wing 50 ft. long and 27 ft. 3 in. deep, and at each end of the structure a rear building containing the main plumbing for the wards, each 16 ft. 6 in. wide and 29 ft. deep, and connected with the main building by a passage 8 ft. wide and 9 ft. 3 in. long.

The building is constructed with a cellar, basement and five upper stories, and the central portion and rear centre wing is carried to a still greater height to contain the Kitchen and Laundry.

To secure a perfect foundation for this building was a matter of considerable anxiety, for while the bottom was so soft that a rod was forced down to a depth of 48 feet on the west end of the lot, solid rock intercropped in its eastern foundation trenches. The sustaining capacity of the soft soil was about two tons to the square foot of surface. It was found impossible to drive piles as the soil contained buried at a considerable depth below its surface, the remains of a former forest, which prevented the passage of the piles, but did not afford a secure bearing. I caused the rock to be blasted from the east trenches to a depth of two feet below the footings, and filled over it with a cushion of the soft soil excavated from the west part of the lot, and by spreading the bearing of the footings until the load was within the sustaining power of the soil, a foundation was secured which has borne the very heavy completed structure without any cracks over the junction of the soft soil and rock.

It was supposed that an unequal settlement of the building at this point was inevitable, and that cracks must necessarily result.

The main entrance is in the centre of the Fifteenth street front, the entrance for ambulances toward the west end of the building.

The Basement, east of the main entrance, is devoted to an out-patient department, which is entered directly from the street. The room is divided by rails into a central vestibule, and rooms for male and female patients. Connected with the main room are private consultation rooms for males and females, which are subdivided by means of movable screens of corrugated iron. Connected with this department are the necessary toilet rooms, &c. West of the main entrance the space is occupied by the principal Apothecary's rooms and small reception wards. Adjoining the ambulance entrance is the room for the gate-keeper. Beyond the ambulance entrance are two small wards and the Autopsy room, the latter is arranged with a gallery for students, and with every convenience of light and plumbing. Adjacent to this room is the dead house.

In the rear centre wing are two night wards, each 13 ft. x 15 ft., a store room, a bed room, and two wards for delirium patients.

The ambulance stable is in the rear east wing, opposite to the Autopsy building. The cellar under the main building is mainly occupied by the heating, ventilating and elevator apparatus. The boiler room is located in the court-yard east of the ambulance entrance. Extensive coal vaults are constructed under the west portion of the court-yard, and commodious storage cellars and refrigerator rooms have been built under the east court-yard.

The principal entrance is located in the centre of the Fifteenth street façade; from it a broad flight of stone steps leads to the vestibule and main hall, opening from which are corridors giving access to the various rooms in the east and west divisions of the building. At the rear of the main hall is a wide, easy, stone staircase, which, together with two steam elevators (situated between it and the main halls), gives access to the different stories of the building. One of these elevators is of sufficient dimensions to contain a bed or stretcher, with its attendants, and of sufficient power to raise its car with safety, if crowded to its capacity (by a load of about thirty persons). The other elevator runs from the cellar to the sixth story, and is used not only for the employees of the hospital, but also by means of a freight car under the passenger car to transport supplies, coal, ice, &c., to the Kitchen and Laundry. The large elevator is reserved for patients and to transport occasionally students or audience to the operating Theatre. In the first story on the right of the east corridor, are the Medical Board's room, the House Surgeon's room, and a private ward; on the left are two private wards for one bed each, and bath and water closet rooms. At the end of the corridor is the children's

ward, 30 ft. 6 in long, by 30 ft. wide, cubic contents, 14,541 cubic feet; connected with this are a nurses' room, bath room, lavatory and water closets, and a storage room for the children's clothing. The West corridor gives access on the left to the main reception room and office.

Connected with it is the Superintendent's office, the House Physician's rooms, and one private ward. On the right are four private wards, a store room and water closets. The private wards are a prominent feature of the Hospital. They are all attractive, bright and cheerful rooms, well lighted and ventilated, and have been luxuriously furnished by the Society. One is of sufficient dimensions to contain two beds if desired.

This corridor also connects with the rooms for the pathological department and with the students' gallery of the Autopsy room.

At the entrance to the gallery of the Autopsy room there is an iron staircase leading to the court. The second, third and fourth stories are constructed on the same plan, and in each story the central hall divides the stories into equal parts, which are similar in arrangement.

These contain six wards, each 29 ft. 6 in. by 77 ft. 3 in. and 16 ft. high. Arrangements are made in each ward for twenty-one beds.

Making a proper allowance for the deep window recesses, each ward contains about 38,000 cubic feet. A little over 1,800 cubic feet of air is thus secured for each patient. Connected with each ward at the centre of the building is a nurses' room, and dining room. Each dining room contains a closet and refrigerator, and is connected with the kitchen by a steam dumb-waiter.

At the extreme end of each ward is a corridor, connecting it with the end wings which contain each a bath room, a hot air, a foot and hip bath room, a lavatory and water closets. Each ward has two closets for linen, and the main hall on each story is provided with closets for patients' clothing.

On the south face of each ward is a wide balcony with seats built permanently into the windows. All corners and angles of the wards are rounded to assist the ventilation and to prevent an accumulation of foul air at any point. The fourth story wards differ from the others in being provided with bidet baths for women.

The west side of the main hall in the fifth story contains a ward for surgical cases, arranged for 19 beds; it is 26 ft. wide, 78 ft. long, and 16 ft. 5 in. high, and contains, with allowance for window recesses, about 35,000 cubic feet, or 1,800 cubic feet of air to each bed. It has in all respects the same arrangement of nurses, dining and bath rooms, &c., as the other wards. In the centre wing on this story is an isolated ward for two beds.

The capacity of the hospital, therefore, exclusive of the children's ward, is 163 beds, including the private wards. Each bed in the wards

is connected with the nurses' room by an electric annunciator, which may at pleasure be connected with, or disconnected from a bell. The pull or button is so arranged that it can, at the discretion of the nurse, be within reach of, or withheld from, the patient. Sockets have been built into the walls behind each bed into which metal brackets are hooked when desired, which swing over the beds ; from these handles are suspended, to enable the patient to raise himself or change his position without assistance. The nurses' rooms are connected with the janitor's room on the first floor by speaking tubes.

The janitor's room is connected with the entrance doors, and with the office in the administration building, and with the private wards, the first story and basement offices, the autopsy room and stables, by speaking tubes or electric annunciators. Each nurse's room is connected with the office by speaking tubes. The ward dining rooms have speaking tube connections with the Kitchen.

The east side of the hall in the fifth story is occupied by the operating Theatre, and the rooms connected with it. The theatre is carefully arranged so that each seat will have an uninterrupted view of the table; it is provided with north and top light, supplied through 261 square feet of hammered glass. The front row of seats is assigned to the hospital and visiting surgeons, and is entered from the floor of the theatre; the other seats are separated from it, and are approached by a staircase from the corridor outside. Adjoining the theatre are lavatories and urinals and toilet rooms ; adjacent to it are two private rooms, a wash room and water closets. In the rear building is a servants' staircase leading to the two upper stories over the central portion of the building; from its hall is entered on this story the servants' water closet.

The sixth story contains the Kitchen, Pantry, Store Room, Laundry, Drying Room and Linen Closet. All are provided with the most perfect apparatus and machinery.

The seventh story is occupied by Wash Rooms, Engine and Blower Rooms, Water Tanks, Exhaust Fan Blower, and Disinfecting Room.

Two stories have been added to the Administrative Building on Sixteenth street, which is situated directly in the rear of the centre of the new building, at a distance at the nearest point of 10 ft. 6 in. from it, and is connected with it by an enclosed bridge at the level of the staircase landing, between the fourth and fifth stories. It is also connected with it on the first story by a balcony running across the Administrative Building, and by a bridge. The lower part of the two new stories, the fourth of the building, contains 17 bed rooms, with a capacity of about 30 beds, for the use of the nurses in the training school connected with the Hospital; also the necessary water closets and baths, and store rooms for linen. The rooms are provided with separate entrances and corridors leading

respectively to the rooms for male and female nurses. The upper story is finished in one room, lighted on all sides by windows and by two skylights. The centre skylight is 22 ft. by 51 ft. in size. This room is appropriated to Convalescents, and is divided by partitions to separate the males from the females. It is 64 ft. wide by 90 ft. long, and has an average height of about 18 ft. The Society has filled this room with rare growing plants, aquaria, and other objects of interest, and it forms an attractive and most beautiful winter garden.

In arranging the system of combined heating and ventilation for the building, I have endeavored to avoid the faults in existing examples and to so arrange the apparatus, that the air in the building should be changed as rapidly as is practicable without the creation of dangerous draughts: to give to the machinery such excess of power that this limit could be reached experimentally, and to raise the limit to the highest possible figure by carefully studying the best form and position for the orifices for the ingress of pure air, and for the egress of foul air. To make the orifices as numerous as possible for the purpose of minutely dividing the currents to render their effect less sensible; to so adjust the pipes experimentally that an equal velocity of currents in both fresh and foul air flues would be secured in all parts of the building, I determined to remove the system from the disturbing action of winds and of external temperature by securing a positive current in both fresh air and foul air flues, by the use of a blower for the one, and an exhaust blower for the other, and to regulate the heat of the air in the fresh air flues without interrupting the volume of air passing through them.

This is a matter of the first importance, for it is obvious that if successful in rapidly removing all the air from a room or ward, and supplying its place with fresh air, and desiring to retain any fixed temperature, the heat of air supplied must be but a trifle in excess of the required temperature itself.

As the means employed to achieve these results are in some respects novel, and as they have proved in the main effective, I shall describe them in detail. Each external pier of the building is a flue; to prevent loss of heat by radiation, each flue is lined with hollow bricks. The fresh air is conducted to the various stories through pipes running through the centre of these flues. These pipes are of cast iron, with turned and closely fitted butts, and are perfectly air tight. The spaces outside these pipes form the ventilating flues for the building. The necessary areas for the pipes from story to story were carefully computed. As they ascend they are diminished in diameter, and as the size of the external flue remains the same as before, the correct relation between the sectional areas of the fresh air flues and ventilating flues is constantly preserved. The steam coils are placed in the cellar, one under each fresh air flue; the coils are

enclosed in galvanized iron boxes about twice the height, and of greater width than the coil, and with a metal division which forms two compartments open at top and bottom, one of which contains the steam coil. At the bottom of this division, and hinged to it, is a valve; the motion of this valve which is regulated from without, permits any required proportion of the air passing into the fresh air pipe to be passed over the steam coil; the balance passing around it. The cold and heated air mix in the pipes above the radiator and any required temperature is obtained without interrupting the volume of air passing into the building. Had the possible depth of cellar permitted, I should have alligned these radiators and valves, and should have arranged them to work from the wards; so that the ward temperature would be under the personal control of the physician in charge, without the intervention of the engineer. The ordinary method of regulating the temperature of a ward has been to partially or wholly shut the register, which proportionally stops the ventilation; or to open windows which causes draughts, or to attempt to decrease the heat without destroying the steam circulation by throttling down the steam at the radiating coils, a plan never successful where the condensed steam is returned to the boiler, or to turn off the radiators in sections, which has proved to be imperfect in action and very troublesome.

The fresh air is taken from the level of the top of the porch 28 ft. above the street curb, and is fed by a powerful blower situated under the porch to each fresh air pipe through a main duct and branch pipes to the radiators. The branch pipes pass through the main duct, presenting their ends to the air current. The velocity of the currents in the branch pipes is regulated by compressing their ends until the velocity in all pipes is equal. Before it is admitted to the pipes, the air is passed through gauge screens, and arrangements are made to spray these screens with fresh water in warm weather. The foul air ducts consist of a system of branch pipes from the top of the vertical flues in the walls, which connect with trunk pipes in the voids of the roofs. These terminate at the sides of the exhaust blower, which is situated in the roof of the centre building under the ventilating lantern. The voids around the boiler flue serve to ventilate the dead house, autopsy room, and a part of the wings adjacent to it.

To neutralize the inevitable draught in winter caused by the cooling of the interior air on the surface of the window glass, and its consequent contraction and increase of weight, the hot air is introduced through the window sills through orifices of a novel form, which I have found experimentally to be the best to accomplish the desired end. It is ejected in fan shaped currents which sweep over the window-glass and carry with them to the ceiling and warm the falling currents of cold air.

The form, direction and velocity of this current will serve a still more important end in preventing the possibility of a draught of even warmed

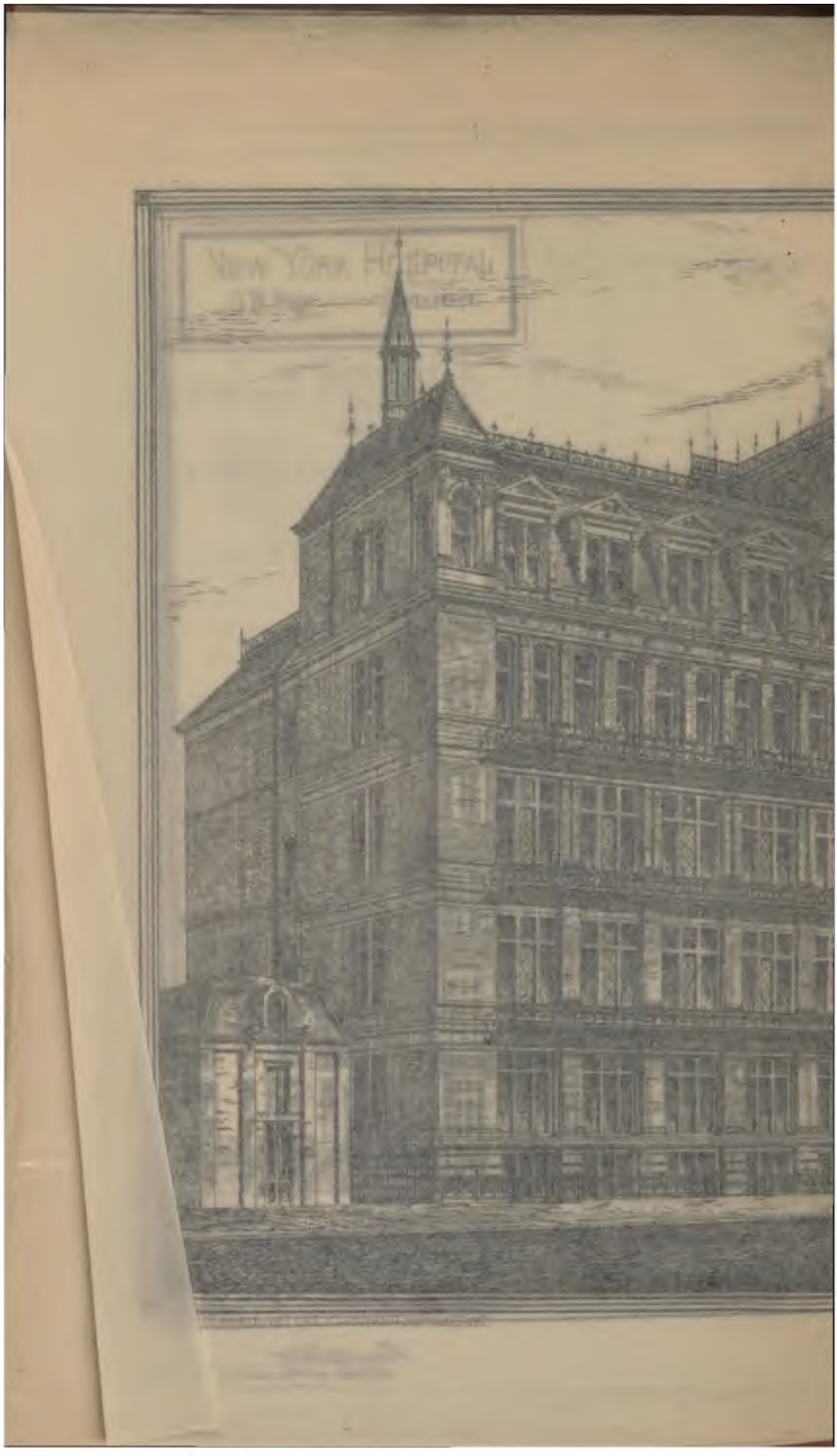
air upon the beds. This I consider a matter of importance, for I have proved by experiment that air at a temperature of 80° to 90° moving with a velocity of 4 or 5 ft. per second, will cause a sensibly cold and (therefore I presume) a dangerous draught.

The positions of the orifices for the exit of foul air is in some respects novel. In addition to a very large number of the ordinary small adjustable registers near the angles of the side walls and ceilings (which I think will be but little used, except in summer) an independent flue is provided for each bed. It is located near its centre, in the floor. Its register (or covering) is raised above the floor so that it draws the foul air through its sides, and serves, to a certain extent, to secure an independent ventilation for each bed. If the blowers were speeded to a sufficient velocity this system would isolate each bed as far as spreading contagion to adjacent beds is concerned, but to do so would produce too great draughts. That it will have this effect partially is undoubtedly true. No doors are provided with fan lights, and if all doors could be kept closed, the ventilation would be assisted, as the ventilation of each room is intended to be perfect in itself. The windows in the wards are opposite to each other, and they are carefully studied to supply air with the minimum draught when they are open. The sills are raised to a considerable height above the floor. The heads are carried as near the ceiling as was practicable; the top sashes are square, and are hinged at the bottom to fall inward. When open they will remain at an angle, and will deflect any incoming breeze to the ceiling. (On account of this angle of the top sash when open, they could not be fitted with shades, and I have consequently had them fitted with stained glass.) The north windows are double, and the sash of both inner and outer windows, except the inner square top sash, are hung with weights. The several sashes are opened and shut from the room by a new mechanical appliance. By opening the bottom outside sash and letting the inner top sash fall inwards, an excellent result is achieved under certain circumstances. (The south windows are provided with iron slat-blinds, which fold into recesses in the stone window jambs.)

Annexed to this report you will find a tabulated statement of the probable cost of the building, as reported by me on February 17th, 1875, and of the actual cost of the completed structure. The important contracts were made before any serious alterations in prices had occurred; the result is a proof of the reliability of my original estimate as an outside figure for the cost of constructing the work then contemplated.

Yours, very respectfully,

GEO. B. POST,
Architect,
120 Broadway, New York.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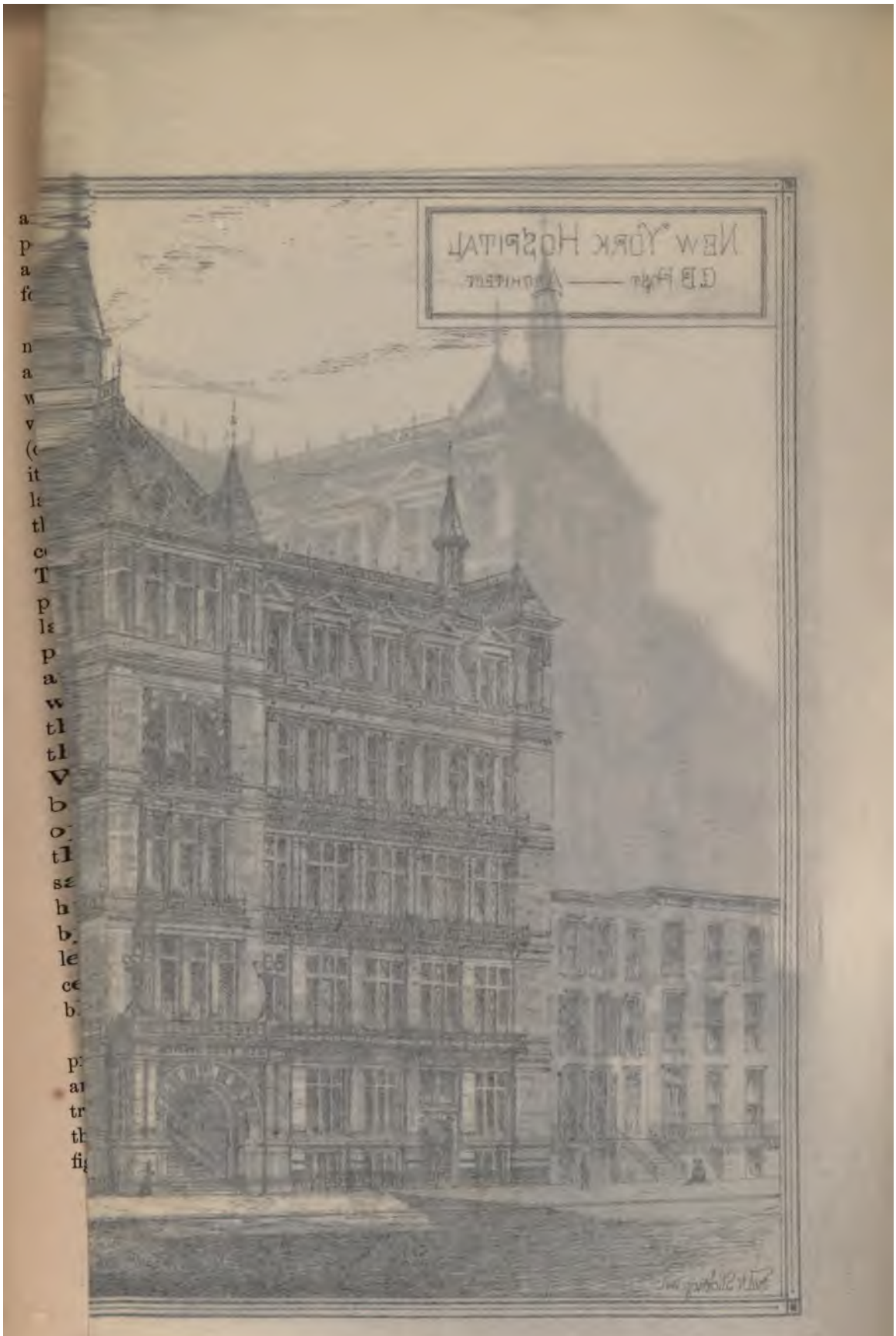
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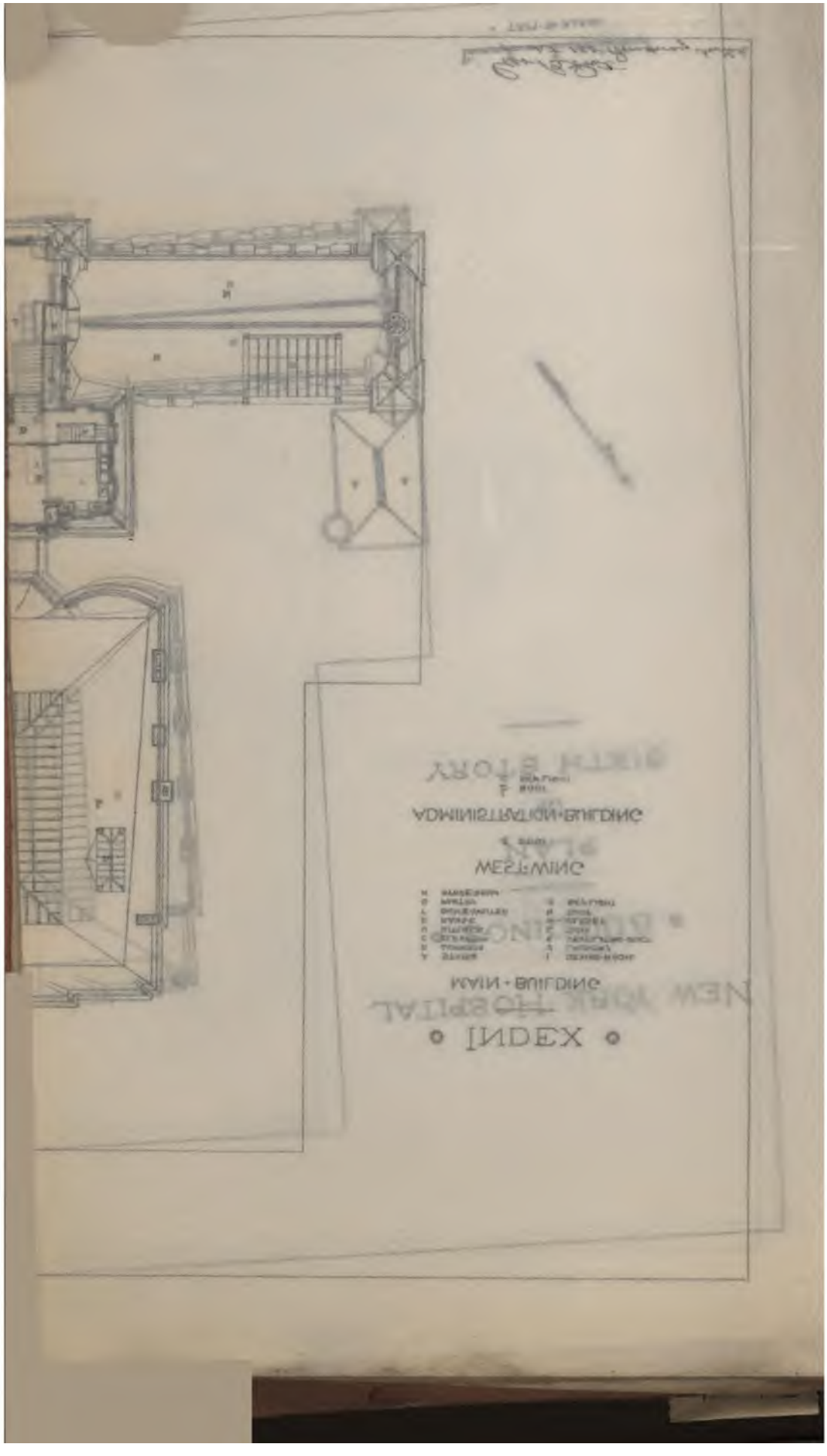

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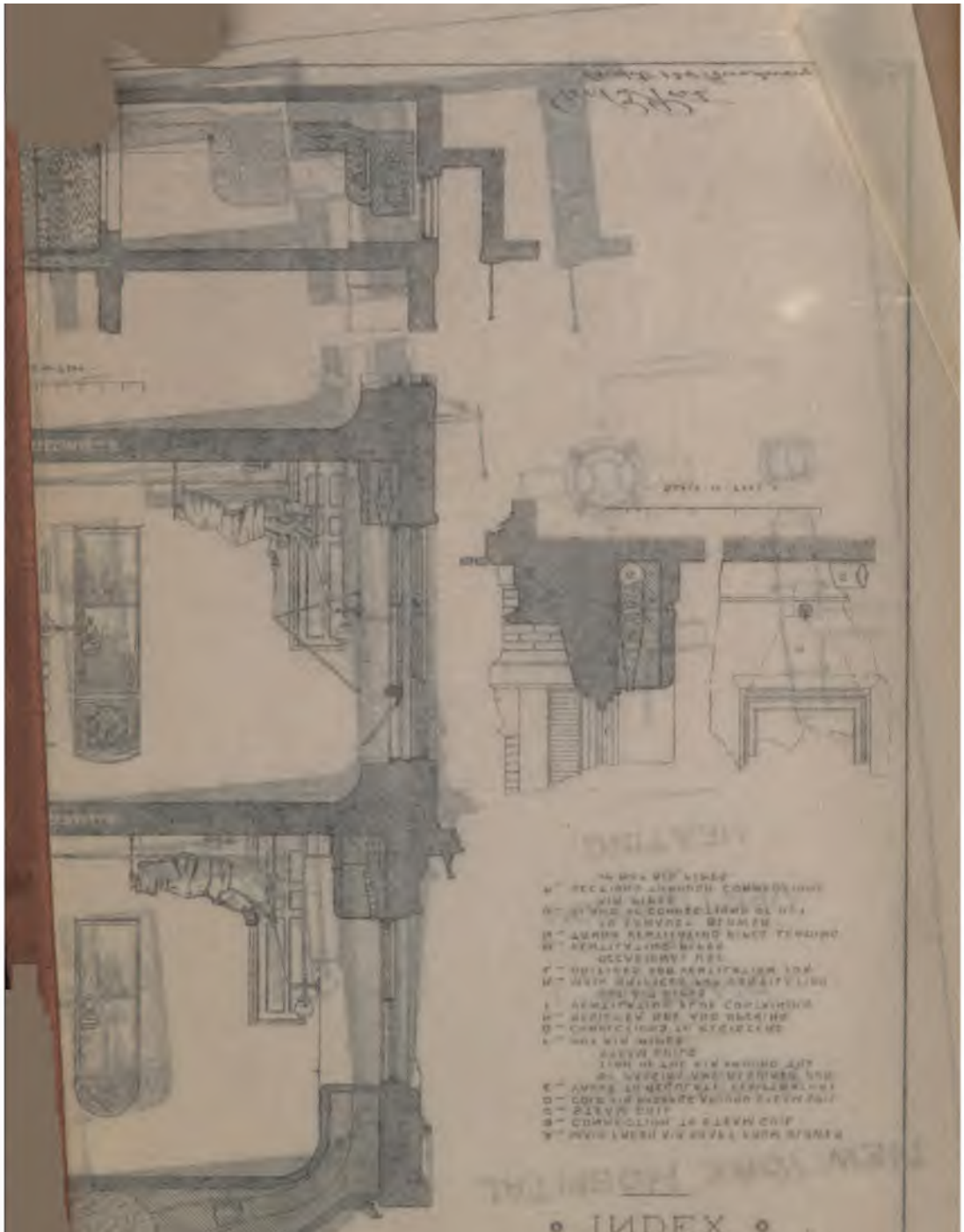

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